

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (Currently Amended): A digital matched filter for despreading on reception side a received signal sequence having been spread on transmission side, comprising:

received signal holding means for successively holding a predetermined number of samples among samples constituting said received signal sequence input in time-series manner;

spreading code generating means for generating a spreading code sequence for said despreading;
and

correlation value calculating means for calculating a correlation value between said predetermined number of samples held in said received signal holding means and said generated spreading code sequence,

said correlation value calculating means including

first product-sum calculating means for calculating a correlation value between a part of the predetermined number of samples held in said received signal holding means and a part of the generated spreading code sequence ~~spreading codes~~ corresponding to said part of the predetermined number of samples ~~in said generated spreading code sequence~~ held in said received signal holding means,

second product-sum calculating means for calculating a correlation value between a remaining ~~part number of samples~~ of the predetermined number of samples held in said received signal holding means and a remaining part of the generated spreading code sequence ~~spreading codes~~ corresponding to said remaining ~~number of samples in said generated spreading code sequence~~ part of the predetermined number of samples held in said received signal holding means, and

decision means for deciding whether the correlation value output from said first product-sum calculating means exceeds a predetermined threshold value to stop calculation by said second product-sum calculating means when said decision means decides that the correlation value output from said first product-sum calculating means does not exceed said predetermined threshold value.

Claim 2 (Currently Amended): A digital matched filter for despreading on reception side a received signal sequence having been spread on transmission side, comprising:

received signal holding means for successively holding samples constituting said received signal sequence input in time-series manner,

said received signal holding means including

a predetermined number of storage circuits for holding samples of said received signal sequence input in time-series manner in parallel in the same predetermined number as said predetermined number of storage circuits,

logic circuits provided at respective preceding stages of said predetermined number of storage circuits, said logic circuits each activated to pass an input signal to a corresponding one of said predetermined number of storage circuits and mask the input signal otherwise,

first control means for cyclically causing write enable state of said predetermined number of storage circuits at a predetermined timing to cyclically write said samples of the received signal sequence input in time-series manner into said predetermined number of storage circuits at said predetermined timing, and

second control means for cyclically activating said ~~predetermined number of~~ logic circuits at said predetermined timing to cyclically input said samples of the received signal sequence input in time-series manner to said predetermined number of storage circuits at said predetermined timing; and

said digital matched filter further comprising
spreading code generating means for generating a spreading code sequence for said despreading;
and
correlation value calculating means for calculating a correlation value between said samples of
the received signal sequence held in parallel in said predetermined number of storage circuits and said
spreading code sequence.

Claim 3 (Currently Amended): The digital matched filter according to claim 2, wherein
said ~~predetermined number~~ of logic circuits each have an input load capacitance smaller than an
input load capacitance of each of said respectively corresponding predetermined number of storage
circuits.

Claim 4 (Canceled).

Claim 5 (Currently Amended): A digital matched filter for despreading on
reception side a received signal sequence having been spread on transmission side,
comprising:

received signal holding means for successively holding samples constituting said
received signal sequence input in time-series manner,

said received signal holding means including

a predetermined number of storage circuits for holding samples of said received
signal sequence input in time-series manner in parallel in the same predetermined number
as said predetermined number of storage circuits,

logic circuits provided at respective preceding stages of said predetermined number of storage circuits, said logic circuits each activated to pass an input signal to a corresponding one of said predetermined number of storage circuits and mask the input signal otherwise,

first control means for cyclically causing write enable state of said predetermined number of storage circuits at a predetermined timing to cyclically write said samples of the received signal sequence input in time-series manner into said predetermined number of storage circuits at said predetermined timing, and

second control means for cyclically activating said ~~predetermined number of~~ logic circuits at said predetermined timing to cyclically input said samples of the received signal sequence input in time-series manner to said predetermined number of storage circuits at said predetermined timing; and

said digital matched filter further comprising

spreading code generating means for generating a spreading code sequence for said despreading;
and

correlation value calculating means for calculating a correlation value between said samples of the received signal sequence held in parallel in said predetermined number of storage circuits and said spreading code sequence,

said correlation value calculating means including

first product-sum calculating means for calculating a correlation value between a part of samples held in said predetermined number of storage circuits and spreading codes corresponding to a corresponding ~~said~~ part of samples in said generated spreading code sequence,

second product-sum calculating means for calculating a correlation value between the rest of samples held in said predetermined number of storage circuits and spreading codes corresponding to a said rest of samples in said generated spreading code sequence, and

decision means for deciding whether the correlation value output from said first product-sum calculating means exceeds a predetermined threshold value to stop calculation by said second product-sum calculating means when said decision means decides that the correlation value output from said first product-sum calculating means does not exceed said predetermined threshold value.

Claim 6 (Currently Amended): The digital matched filter according to claim 5, wherein

said ~~predetermined number of~~ logic circuits each have an input load capacitance smaller than an input load capacitance of each of said respectively corresponding predetermined number of storage circuits.

Claim 7 (Currently Amended): A digital matched filter for despreading on reception side a received signal sequence having been spread on transmission side, comprising:

received signal holding means for successively holding samples constituting said received signal sequence input in time-series manner,

said received signal holding means including

a first predetermined number of storage circuits for holding samples of said received signal sequence input in time-series manner in parallel in the same predetermined number as said first predetermined number of storage circuits, said first predetermined number of storage circuits being divided into a second predetermined number of groups,

logic circuits provided at respective preceding stages of said first predetermined number of storage circuits, said logic circuits each activated to pass an input signal to a corresponding one of

said predetermined number of storage circuits and mask the input signal otherwise,

first control means for cyclically causing write enable state of said first predetermined number of storage circuits at a predetermined timing to cyclically write said samples of the received signal sequence input in time series manner into said first predetermined number of storage circuits at said predetermined timing, and

second control means for cyclically activating said ~~first predetermined number of~~ logic circuits at said predetermined timing to cyclically input said samples of the received signal sequence input in time series manner to said first predetermined number of storage circuits at said predetermined timing;

said digital matched filter further comprising

spreading code generating means for generating a spreading code sequence for said despreading; and

correlation value calculating means provided respectively corresponding to said second predetermined number of groups each for calculating a correlation value between samples of a corresponding one of said second predetermined number of group and said spreading code sequence,

each of said correlation value calculating means including

first product-sum calculating means for calculating a correlation value between a part of samples held in the storage circuits of the corresponding group and spreading codes corresponding to ~~said a~~ a corresponding part of samples in said generated spreading code sequence,

second product-sum calculating means for calculating a correlation value between the rest of samples held in said storage circuits of the corresponding group and spreading codes corresponding to ~~said a~~ a rest of samples in said generated spreading code sequence, and

decision means for deciding whether the correlation value output from said first product-sum calculating means exceeds a predetermined threshold value to stop calculation by said second product-sum calculating means when said decision means decides that the correlation value output from said first product-sum calculating means does not exceed said predetermined threshold value; and

said digital matched filter further comprising

output control means for successively outputting in time-series manner respective correlation values output from respective ones of said correlation value calculating means as correlation values output from one system.

Claim 8 (Currently Amended): The digital matched filter according to claim 7, wherein

said ~~first predetermined number of~~ logic circuits each have an input load capacitance smaller than an input load capacitance of each of said respectively corresponding first predetermined number of storage circuits.

Claim 9 (Previously Presented): A mobile wireless terminal for digital radio communication comprising

reception-related modem means for demodulating received digital data and

signal processing means for processing a signal received by said reception-related modem means to output the processed signal,

said reception-related modem means including a digital matched filter for despreading on reception side a received signal sequence having been spread on transmission side,

said digital matched filter comprising:

received signal holding means for successively holding a predetermined number of samples among samples constituting said received signal sequence input in time-series manner;

spreading code generating means for generating a spreading code sequence for said despreading;
and

correlation value calculating means for calculating a correlation value between said predetermined number of samples held in said received signal holding means and said generated spreading code sequence,

said correlation value calculating means including

first product-sum calculating means for calculating a correlation value between a part of the predetermined number of samples held in said received signal holding means and spreading codes corresponding to said part of the predetermined number of samples in said generated spreading code sequence,

second product-sum calculating means for calculating a correlation value between a remaining number of samples of the predetermined number of samples held in said received signal holding means and spreading codes corresponding to said remaining number of samples in said generated spreading code sequence, and

decision means for deciding whether the correlation value output from said first product-sum calculating means exceeds a predetermined threshold value to stop calculation by said second product-sum calculating means when said decision means decides that the correlation value output from said first product-sum calculating means does not exceed said predetermined threshold value.

Claim 10 (Currently Amended): A mobile wireless terminal for digital radio communication comprising:

reception-related modem means for demodulating received digital data and

signal processing means for processing a signal received by said reception-related modem means to output the processed signal,

said reception-related modem means including a digital matched filter for despread on reception side a received signal sequence having been spread on transmission side,

said digital matched filter comprising:

received signal holding means for successively holding samples constituting said received signal sequence input in time-series manner,

said received signal holding means including

a predetermined number of storage circuits for holding samples of said received signal sequence input in time-series manner in parallel in the same predetermined number as said predetermined number of storage circuits,

logic circuits provided at respective preceding stages of said predetermined number of storage circuits, said logic circuits each activated to pass an input signal to a corresponding one of said predetermined number of storage circuits and mask the input signal otherwise,

first control means for cyclically causing write enable state of said predetermined number of storage circuits at a predetermined timing to cyclically write said samples of the received signal sequence input in time-series manner into said predetermined number of storage circuits at

said predetermined timing, and

second control means for cyclically activating said ~~predetermined number of~~ logic circuits at said predetermined timing to cyclically input said samples of the received signal sequence input in time-series manner to said predetermined number of storage circuits at said predetermined timing; and

said digital matched filter further comprising

spreading code generating means for generating a spreading code sequence for said despreading; and

correlation value calculating means for calculating a correlation value between said samples of the received signal sequence held in parallel in said predetermined number of storage circuits and said spreading code sequence.

Claim 11 (Currently Amended): The mobile wireless terminal according to claim 10, wherein

said ~~predetermined number of~~ logic circuits each have an input load capacitance smaller than an input load capacitance of each of said respectively corresponding predetermined number of storage circuits.

Claim 12 (Canceled).

Claim 13 (Currently Amended): A mobile wireless terminal for digital radio communication comprising

reception-related modem means for demodulating received digital data and
signal processing means for processing a signal received by said reception-related modem means to output the processed signal,

said reception-related modem means including a digital matched filter for despreading on reception side a received signal sequence having been spread on transmission side,

said digital matched filter comprising:

received signal holding means for successively holding samples constituting said received signal sequence input in time-series manner,

said received signal holding means including

a predetermined number of storage circuits for holding samples of said received signal sequence input in time-series manner in parallel in the same predetermined number as said predetermined number of storage circuits,

logic circuits provided at respective preceding stages of said predetermined number of storage circuits, said logic circuits each activated to pass an input signal to a corresponding one of said predetermined number of storage circuits and mask the input signal otherwise,

first control means for cyclically causing write enable state of said predetermined number of storage circuits at a predetermined timing to cyclically write said samples of the received signal sequence input in time-series manner into said predetermined number of storage circuits at said predetermined timing, and

second control means for cyclically activating said ~~predetermined number of~~ logic circuits at said predetermined timing to cyclically input said samples of the received signal

sequence input in time-series manner to said predetermined number of storage circuits at said predetermined timing; and

said digital matched filter further comprising

spreading code generating means for generating a spreading code sequence for said despreading;

and

correlation value calculating means for calculating a correlation value between said samples of the received signal sequence held in parallel in said predetermined number of storage circuits and said spreading code sequence,

said correlation value calculating means including

first product-sum calculating means for calculating a correlation value between a part of samples held in said predetermined number of storage circuits and spreading codes corresponding to a corresponding said part of samples in said generated spreading code sequence,

second product-sum calculating means for calculating a correlation value between the rest of samples held in said predetermined number of storage circuits and spreading codes corresponding to a said rest of samples in said generated spreading code sequence, and

decision means for deciding whether the correlation value output from said first product-sum calculating means exceeds a predetermined threshold value to stop calculation by said second product-sum calculating means when said decision means decides that the correlation value output from said first product-sum calculating means does not exceed said predetermined threshold value.

Claim 14 (Currently Amended): The mobile wireless terminal according to claim 13, wherein
said ~~predetermined number of~~ logic circuits each have an input load capacitance smaller than an
input load capacitance of each of said respectively corresponding predetermined number of storage
circuits.

Claim 15 (Currently Amended): A mobile wireless terminal for digital radio communication
comprising

reception-related modem means for demodulating received digital data and
signal processing means for processing a signal received by said reception-related modem means
to output the processed signal,

said reception-related modem means including a digital matched filter for despreading on
reception side a received signal sequence having been spread on transmission side,

said digital matched filter comprising:

received signal holding means for successively holding samples constituting said received
signal sequence input in time-series manner,

said received signal holding means including

a first predetermined number of storage circuits for holding samples of said received
signal sequence input in time-series manner in parallel in the same predetermined number as said
predetermined number of storage circuits, said first predetermined number of storage circuits being
divided into a second predetermined number of groups,

logic circuits provided at respective preceding stages of said first predetermined number of
storage circuits, said logic circuits each activated to pass an input signal to a corresponding one of
said predetermined number of storage circuits and mask the input signal otherwise,

first control means for cyclically causing write enable state of said first predetermined number of storage circuits at a predetermined timing to cyclically write said samples of the received signal sequence input in time-series manner into said first predetermined number of storage circuits at said predetermined timing, and

second control means for cyclically activating said ~~first predetermined number of~~ logic circuits at said predetermined timing to cyclically input said samples of the received signal sequence input in time-series manner to said first predetermined number of storage circuits at said predetermined timing;

said digital matched filter further comprising

spreading code generating means for generating a spreading code sequence for said despreading; and

correlation value calculating means provided respectively corresponding to said second predetermined number of groups each for calculating a correlation value between samples of a corresponding one of said second predetermined number of group and said spreading code sequence,

each of said correlation value calculating means including

first product-sum calculating means for calculating a correlation value between a part of samples held in the storage circuits of the corresponding group and spreading codes corresponding to ~~said a~~ a corresponding part of samples in said generated spreading code sequence,

second product-sum calculating means for calculating a correlation value between the rest of samples held in said storage circuits of the corresponding group and spreading codes corresponding to ~~said a~~ a rest of samples in said generated spreading code sequence, and

decision means for deciding whether the correlation value output from said first product-sum calculating means exceeds a predetermined threshold value to stop calculation by said

second product-sum calculating means when said decision means decides that the correlation value output from said first product-sum calculating means does not exceed said predetermined threshold value; and

said digital matched filter further comprising

output control means for successively outputting in time-series manner respective correlation values output from respective ones of said correlation value calculating means as correlation values output from one system.

Claim 16 (Currently Amended): The mobile wireless terminal according to claim 15, wherein said ~~first predetermined number of~~ logic circuits each have an input load capacitance smaller than an input load capacitance of each of said respectively corresponding first predetermined number of storage circuits.